Docket No.: 050340-0181 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	:	Customer Number: 20277
Takashi FUKUDA	:	Confirmation Number: 2751
Application No.: 10/520,082	:	Tech Center Art Unit: 1795
Filed: January 05, 2005	:	Examiner: HODGE, Robert W.

For: FUEL CELL POWER PLANT

TRANSMITTAL OF APPEAL BRIEF

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

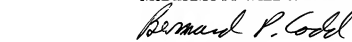
Sir:

Submitted herewith is Appellant's Appeal Brief in support of the Notice of Appeal filed July 2, 2009. Please charge the Appeal Brief fee of $540.00 to Deposit Account 500417.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due under 37 C.F.R. 1.17 and 41.20, and in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



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APPEAL BRIEF

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed July 2, 2009, wherein Appellant appeals from the Primary Examiner's rejection of claims 1-14.

Real Party In Interest

This application is assigned to Nissan Motor Co., Ltd. by assignment recorded on January 5, 2005, at Reel 016692, Frame 0443.

Related Appeals and Interferences

Appellant is unaware of any related appeals and interferences.

Status of Claims

1. Claims withdrawn from consideration, but not canceled: 15.

2. Claims pending: 1-15.

3. Claims rejected: 1-14.

4. Claims on appeal: 1-14.

Status of Amendments

No amendments were filed after the final rejection of April 3, 2009.

Summary of Claimed Subject Matter

An aspect of the invention, per independent claim 1, is a fuel cell power plant which uses water for operation comprising an antifreeze mechanism (15, 16) for preventing freezing of water in the fuel cell power plant, a sensor (2, 11, 12, 31) which detects a parameter for estimating a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant stops, and a programmable controller (30) (page 2, line 19 to page 3, line 2; page 8, line 22 to page 9, line 1; and page 9, lines 9 to 23 of the written description). The programmable controller (30) is programmed to estimate the freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant has stopped based on the parameter (S13, S52), estimate a wait time from when the power plant has stopped operating based on the freezing probability (S16, S56), and suspend operation of the antifreeze mechanism (15, 16) until the wait time has elapsed from when the fuel cell power plant stops operating (S18, S20, S55, S58, S61, S62, S63) (page 3, lines 3 to 8; page 13, lines 4 to 6; page 15, line 7 to page 16, line 14; and page 22, line 19 to page 24, line 5 of the written description).

Another aspect of the invention, per claim 14, is a fuel cell power plant which uses water for operation, comprising means for preventing freezing of water in the fuel cell power plant (15, 16) and a means for detecting a parameter for estimating a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant stops (2, 11, 12, 31) (page 2, line 19 to page 3, line 2; page 8, line 22 to page 9, line 1; and page 9, lines 9 to 23 of the written description). The fuel cell

power plant further comprises means for estimating the probability of water freezing in the fuel cell power plant after operation of the fuel cell power plant has stopped based on the parameter (30), means for estimating a wait time from when the power plant has stopped operating based on the freezing probability (30), and means for suspending operation of the antifreeze means until the wait time has elapsed from when the fuel cell power plant stops operating (30) (page 3, lines 3 to 8; page 13, lines 4 to 6; page 15, line 7 to page 16, line 14; and page 22, line 19 to page 24, line 5 of the written description).

Grounds of Rejection To Be Reviewed By Appeal

Claims 1-8, 11, and 14 were rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Bonville (US 6,248,462).

Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bonville in view of Komura et al. (US 6,242,119).

Claims 12 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bonville in view of Yoshizawa et al. (US 2003/0003334).

Argument

Rejection under 35 U.S.C. § 102(b) in view of Bonville.

Claim 1-8 and 11

Examiner's Position:

The Examiner asserted that Bonville teaches a fuel cell plant having an antifreeze mechanism which comprises a heater, a temperature sensor, a programmable controller, all of the structure necessary to perform the functional limitations, and many of the functions of the instant claims to

prevent freezing of water in the fuel cell system to prevent damage from occurring to the fuel cell stack.

Appellant's Position:

Bonville does not anticipate claim 1 because Bonville does not disclose a programmable controller programmed to: estimate a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant has stopped based on the parameter, estimate a wait time from when the power plant has stopped operating based on the freezing probability, and suspend operation of the antifreeze mechanism until the wait time has elapsed from when the fuel cell power plant stops operating, as required by claim 1.

The Examiner apparently believes that because the controller of Bonville may be capable of being programmed to perform the above steps, that Bonville anticipates the present claims. Contrary to the Examiner's apparent assumption, it is well settled law that a programmed controller is patentably distinct from an unprogrammed controller.

> [I]f a machine is programmed in a certain new and unobvious way, it is physically different from a machine without that program; its memory elements are differently arranged. The fact that these physical changes are invisible to the eye should not tempt us to conclude that the machine has not been changed. If a new machine has not been invented, certainly a "new and useful improvement" of the unprogrammed machine has been, and Congress has said in 35 U.S.C. § 101 that such improvements are statutory subject matter for a patent.
> *In re Bernhart*, 417 F.2d 1395, 1400 (C.C.P.A. 1969).

The Examiner relied on MPEP § 2114 as allegedly supporting his position. According to MPEP § 2114, "[w]hile features of an apparatus may be recited either structurally or functionally, claims< directed to >an< apparatus must be distinguished from the prior art in terms of structure rather than function. >" *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). Further, "[a] claim containing a "recitation with respect to the manner in which a claimed

apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham,* 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). As is clear from the *Bernhart* decision, the programmable controller of the present claims is structurally distinct from the prior art controller, as its memory elements are differently arranged. Therefore, Bonville does not disclose all the claimed structural limitations and does not anticipate claim 1.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.,* 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.,* 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Bonville does not disclose a programmable controller programmed to: estimate a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant has stopped based on the parameter, estimate a wait time from when the power plant has stopped operating based on the freezing probability, and suspend operation of the antifreeze mechanism until the wait time has elapsed from when the fuel cell power plant stops operating, as required by claim 1, Bonville does not anticipate claim 1.

Applicant further submits that Bonville does not suggest the claimed fuel cell power plant.

Claim 14

Examiner's Position:

The Examiner asserted that Bonville teaches a fuel cell plant having an antifreeze mechanism which comprises a heater, a temperature sensor, a programmable controller, all of the structure necessary to perform the functional limitations, and many of the functions of the instant claims to prevent freezing of water in the fuel cell system to prevent damage from occurring to the fuel cell stack.

Appellant's Position:

Bonville does not anticipate claim 14 because Bonville does not disclose means for estimating a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant stops, means for estimating a wait time from when the power plant has stopped operating based on the freezing probability, and means for suspending operation of the antifreeze mechanism until the wait time has elapsed from when the fuel cell power plant stops operating, as required by claim 14.

The Examiner apparently believes that because the controller of Bonville may be capable of being programmed to perform the above steps, that Bonville anticipates the present claims. Contrary to the Examiner's apparent assumption, it is well settled law that a programmed controller is patentably distinct from an unprogrammed controller.

> [I]f a machine is programmed in a certain new and unobvious way, it is physically different from a machine without that program; its memory elements are differently arranged. The fact that these physical changes are invisible to the eye should not tempt us to conclude that the machine has not been changed. If a new machine has not been invented, certainly a "new and useful improvement" of the unprogrammed machine has been, and Congress has said in 35 U.S.C. § 101 that such improvements are statutory subject matter for a patent.
> *In re Bernhart*, 417 F.2d 1395, 1400 (C.C.P.A. 1969).

The Examiner relied on MPEP § 2114 as allegedly supporting its position. According to MPEP

§ 2114, "[w]hile features of an apparatus may be recited either structurally or functionally, claims< directed to >an< apparatus must be distinguished from the prior art in terms of structure rather than function. >" *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). Further, "[a] claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). As is clear from the *Bernhart* decision, the programmable controller of the present claims is structurally distinct from the prior art controller, as its memory elements are differently arranged. Therefore, Bonville does not disclose all the claimed structural limitations and does not anticipate claim 14.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Bonville does not disclose means for estimating a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant stops, means for estimating a wait time from when the power plant has stopped operating based on the freezing probability, and means for suspending operation of the antifreeze mechanism until the wait time has elapsed from when the fuel cell power plant stops operating, as required by claim 14, Bonville does not anticipate claim 14.

Applicant further submits that Bonville does not suggest the claimed fuel cell power plant.

Rejection under 35 U.S.C. § 103(a) over Bonville in view of Komura et al.

Claims 9 and 10

The Examiner's Position:

The Examiner acknowledged that Bonville does not teach a drain valve to drain away excess water from the fuel cell system but teaches that it is necessary to remove excess water from the fuel cell system. Komura et al. was relied on for teaching a fuel cell system comprising an anode, cathode, condenser, and a water tank with a drain valve. The Examiner concluded that it would have been obvious to provide a drain valve in Bonville in order to provide the ability to remove excess water from the fuel cell system to prevent flooding of the fuel cell system as well as to prevent freezing of the water in the fuel cell when the system is stopped to thereby prevent damage to the fuel cell from the freezing.

Appellant's Position:

Bonville and Komura et al., whether taken alone, or taken in combination, do not suggest the claimed fuel cell power plant because Komura et al. do not cure the deficiencies of Bonville. Komura et al. do not suggest a programmable controller programmed to: estimate a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant has stopped based on the parameter, estimate a wait time from when the power plant has stopped operating based on the freezing probability, and suspend operation of the antifreeze mechanism until the wait time has elapsed from when the fuel cell power plant stops operating, as required by claim 1.

Rejection under 35 U.S.C. § 103(a) over Bonville in view of Yoshizawa et al.

Claims 12 and 13

The Examiner's Position:

The Examiner acknowledged that Bonville does not teach a temperature sensor to monitor a temperature outside of the fuel cell system. The Examiner relied on Yoshizawa et al. for the teaching of a fuel cell system that comprises an atmospheric temperature sensor that detects an atmospheric temperature outside of the fuel cell system. The Examiner concluded that it would have been obvious to provide an atmospheric temperature sensor in Bonville in order to monitor the temperature of the fuel gas and air entering the fuel cell thereby providing the ability to calculate heat exchange between the temperature inside the fuel cell and the reactants entering the fuel cell, thus providing a means to determine whether or not the secondary thermal management loop of Bonville needs to provide further heat to the fuel cell to maintain the fuel cell at its optimal operating temperature.

Appellant's Position:

Bonville and Yoshizawa et al., whether taken alone, or taken in combination, do not suggest the claimed fuel cell power plant because Yoshizawa et al. do not cure the deficiencies of Bonville. Yoshizawa et al. do not suggest a programmable controller programmed to: estimate a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant has stopped based on the parameter, estimate a wait time from when the power plant has stopped operating based on the freezing probability, and suspend operation of the antifreeze mechanism until the wait time has elapsed from when the fuel cell power plant stops operating, as required by claim 1.

Conclusion

Based upon the arguments submitted supra, Appellant respectfully submits that the Examiner's rejections under 35 U.S.C. §§ 102 and 103 are not legally viable. Appellant, therefore, respectfully solicits the Honorable Board to reverse the Examiner's rejection of claims 1-8, 11, and 14 as anticipated, as evidenced by Bonville; claims 9 and 10 as obvious, as evidenced by Bonville in view of Komura et al., and claims 12 and 13 as obvious, as evidenced by Bonville in view of Yoshizawa et al.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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Please recognize our Customer No. 20277 as our correspondence address.

CLAIMS APPENDIX

1. A fuel cell power plant which uses water for operation, comprising:

an antifreeze mechanism for preventing freezing of water in the fuel cell power plant;

a sensor which detects a parameter for estimating a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant stops; and

a programmable controller programmed to:

estimate the freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant has stopped based on the parameter;

estimate a wait time from when the power plant has stopped operating based on the freezing probability; and

suspend operation of the antifreeze mechanism until the wait time has elapsed from when the fuel cell power plant stops operating.

2. The power plant as defined in Claim 1, wherein the controller is further programmed to set the wait time to be shorter as the freezing probability increases.

3. The power plant as defined in Claim 1, wherein the fuel cell power plant further comprises a sensor which detects the water temperature inside the fuel cell power plant, and the controller is further programmed to set the wait time to be longer as the water temperature when the fuel cell power plant stops operating rises.

4. The power plant as defined in Claim 1, wherein the controller is further programmed to operate the antifreeze mechanism after the wait time has elapsed.

5. The power plant as defined in Claim 4, wherein the controller is further programmed to update the freezing probability based on the parameter detected after the wait time has elapsed, and

operate the antifreeze mechanism only when an updated freezing probability exceeds a predetermined factor.

6. The power plant as defined in Claim 5, wherein the controller is further programmed, when the updated freezing probability does not exceed the predetermined factor, to recalculate the wait time based on the updated freezing probability, re-update the freezing probability after the recalculated wait time has elapsed, and operate the antifreeze mechanism only when the re-updated freezing probability exceeds the predetermined factor.

7. The power plant as defined in Claim 6, wherein the controller is further programmed to predict a variation characteristic of freezing probability from a variation of the estimated freezing probability in the past, and correct the re-updated freezing probability based on the variation characteristic.

8. The power plant as defined in Claim 4, wherein the power plant comprises a water recovery mechanism which recovers and stores part of the remaining water when the power plant stops operating, and the controller is further programmed to operate the water recovery mechanism before operating the antifreeze mechanism.

9. The power plant as defined in Claim 1, wherein the antifreeze mechanism comprises a drain valve which drains part of remaining water in the fuel cell power plant.

10. The power plant as defined in Claim 9, wherein the power plant further comprises a fuel cell stack comprising an anode and a cathode, a condenser which condenses water vapor in cathode effluent discharged from the cathode, a water tank which recovers water condensed in the condenser, a humidifier which humidifies gas supplied to the anode, and a water passage which supplies water for humidification to the condenser from the water tank, the antifreeze mechanism comprises a drain which drains water from the water passage, and the drain valve which opens and closes the drain.

11. The power plant as defined in Claim 1, wherein the antifreeze mechanism comprises a heater which heats part of the remaining water in the fuel cell power plant.

12. The power plant as defined in Claim 1, wherein the parameter comprises one of an outside air temperature and climactic data corresponding to a present location of the power plant.

13. The power plant as defined in Claim 1, wherein the sensor comprises a sensor which detects a temperature outside the power plant as the parameter, and the controller is further programmed to calculate the freezing probability based on the outside air temperature.

14. A fuel cell power plant which uses water for operation, comprising:

means for preventing freezing of water in the fuel cell power plant;

means for detecting a parameter for estimating a freezing probability of water in the fuel cell power plant after operation of the fuel cell power plant stops;

means for estimating the probability of water freezing in the fuel cell power plant after operation of the fuel cell power plant has stopped based on the parameter;

means for estimating a wait time from when the power plant has stopped operating based on the freezing probability; and

means for suspending operation of the antifreeze means until the wait time has elapsed from when the fuel cell power plant stops operating.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.